SALIENT CHARACTERISTICS

SIGNAL GENERATOR (2.3 TO 6.5 GHZ)
GEAJY-A

1.0 GENERAL This procurement requires a stable microwave signal generator capable of generating signals over the frequency range of 2.3 to 6.5 Ghz with internal and external modulation capabilities.

2.0 CLASSIFICATION The equipment shall meet the requirements of MIL-T-28800(), Type III, Class 5, Style E, Color R for Navy shipboard, submarine, and shore applications with the following modifications and exceptions:

a. The non-operating temperature requirement is limited to the range of -40°C to +70°C.

b. The relative humidity requirement is limited to 95% noncondensating.

c. The operating and non-operating altitude requirements are not invoked.

d. The EMI requirement is limited to CE01, CE03, CS01, CS02 (.05 to 100 Mhz), CS06, RE02 (14KHz - 1Ghz), and RS03.

e. The warm-up time is extended to one hour.

3.0 OPERATIONAL REQUIREMENTS The equipment shall be capable of generating signals within the parameters and accuracies specified herein.

3.1 Frequency Characteristics

3.1.1 Frequency Range: At least 2.3 to 6.5 Ghz.

3.1.2 Frequency Resolution: Minimum resolution of at least 5 Mhz; digital readout.

3.1.3 Frequency Accuracy: Within ± 1% of the actual measured output frequency.

3.1.4 Frequency Stability (equal to or better than limits specified below).

3.1.4.1 Warm-up Less than 100 KHz/hr at 25°C ± 5°C after one hour warm-up.

3.1.4.2 Temperature: Less than 15 MHz over 0 to 50°C temperature range.

3.1.5 Residual FM (CW mode in 50 Hz to 15 KHz detection BW): Less than 10 KHz peak.

3.1.6 Spectral Purity (equal to or better than limits specified below).

3.1.6.1 Harmonics: All harmonically related outputs shall be at least -25 dBc.

3.1.6.2 Non-Harmonics/Spurious: At least -55 dBc.

3.1.6.3 Phase Noise: Less than -65 dBc/Hz at 10 KHz offset from carrier.

3.2 Output Characteristics

3.2.1 Range: +10 to -110 dBm (minimum).

3.2.2 RF Output: Leveled output shall be at least +10 dBm.

3.2.3 Accuracy: ±2.5 dB of the actual measured output level.

3.2.4 Display/Resolution: Digital display; minimum resolution of 0.1 dB.

3.2.5 Flatness: ±1.0 dB measured at an output level of 0 dB.

3.2.6 Impedance/Connector: 50 ohms; type-N female connector.

3.2.6.1 VSWR: The maximum VSWR of the output connector shall be no greater than 2:1.

3.2.7 Reverse Power Protection: The generator shall be capable of accepting the following signal levels at its output connector without resulting damage.

3.2.7.1 Average Power: 4 watts.
3.2.7.2 Peak Power: 3.5 kW.

3.3 Modulation Characteristics

3.3.1 Pulse Modulation:

3.3.1.1 Internal:

3.3.1.1.1 Rate (PRF): At least 100 Hz to 50 KHz.
3.3.1.1.2 Width (PW): 0.1 to 10.0 microseconds.
3.3.1.1.3 Rise and Fall Times: Less than 50 nanoseconds.
3.3.1.1.4 ON/OFF Ratio: Greater than 80 dB.

3.3.1.1.5 Delay: At least 50 nanoseconds to 100 milliseconds; accuracy 20% of setting.

3.3.1.1.6 Sync Pulse Output: TTL compatible; risetime less than 50 nanoseconds.

3.3.1.1.7 Video Pulse Output: TTL compatible; width corresponds to PW control setting.

3.3.1.1.8 External Trigger Input Voltage: Less than 25 V peak and greater than 2 V peak; at least 100 Hz to 50 KHz, provides sync rate for pulse modulation.

3.3.1.2 External:

3.3.1.2.1 Rate (PRF): At least 100 Hz to 50 KHz.
3.3.1.2.2 Width (PW): Greater than 0.1 microseconds.
3.3.1.2.3 Video Output: TTL compatible pulse; same PW and PRF as external input pulse.

3.3.2 Amplitude Modulation (AM):

3.3.2.1 Internal AM (Square-wave):

3.3.2.1.1 Rate: At least 1 KHz.
3.3.2.1.2 Depth: 0 to 70% minimum.

3.3.2.2 External AM:

3.3.2.2.1 Rates: At least 10 Hz to 10 KHz.
3.3.2.2.2 Depth: 0 to 70% minimum.
3.3.2.2.3 Distortion: Less than 5% at 50% depth and 1 KHz rate.

3.3.3 Frequency Modulation (FM):

3.3.3.1 Internal FM:

3.3.3.1.1 Rate: At least 1 KHz.
3.3.3.1.2 FM Deviation: At least 5 MHz peak.

3.3.3.2 External FM:

3.3.3.2.1 Rates: At least 100 Hz to 1.0 MHz.
3.3.3.2.2 FM Deviation: At least 5 MHz peak.
3.3.3.2.3 Distortion: Less than 5%.

4.0 GENERAL REQUIREMENTS

4.1 Power: 115 or 230 Vac ±10%, single phase, 50, 60 or 400 Hz, 200 watts maximum.

4.2 Calibration Interval: The calibration interval shall be at least 12 months minimum. The equipment shall be within all accuracy requirements specified herein, with a 72% or greater confidence factor following a calibration interval of 12 months.

4.3 Dimensions: The total volume of the unit shall not exceed 1800 cubic in (29,500 cubic cm).

4.4 Weight: The overall weight of the unit shall not exceed 50 pounds (22.7 kg).